

Chroma-COS

Applications:

- Odor control monitoring
- Deodorisation process
- Fugitive emissions
- Process control
- Fence line, ...



Targetted compounds:

- H_2S
- SO_2
- Methyl mercaptan
- Ethyl mercaptan
- DMS
- DMDS
- DES
- CS_2
- NH_3
- More sulfurs (option)
- Odor Index

- Analysis principles
- Internal modules presentation
- Installation
- Software
- Calibration
- Service
- Preventive maintenance
- Troubleshooting
- Remote control
- Chromatotec Technical website

Analysis principles



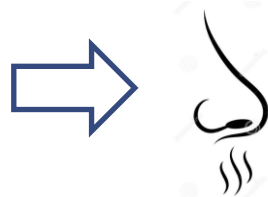
Two analytical instruments = combination between:



ChromaS:



- Gas Chromatograph
 - ✓ Real separation between sulfurs
 - ✓ 2 chromatographic columns
 - ✓ Sampling loop
 - ✓ FPD specific to sulfurs
 - ✓ Speciation of the sulfur compounds

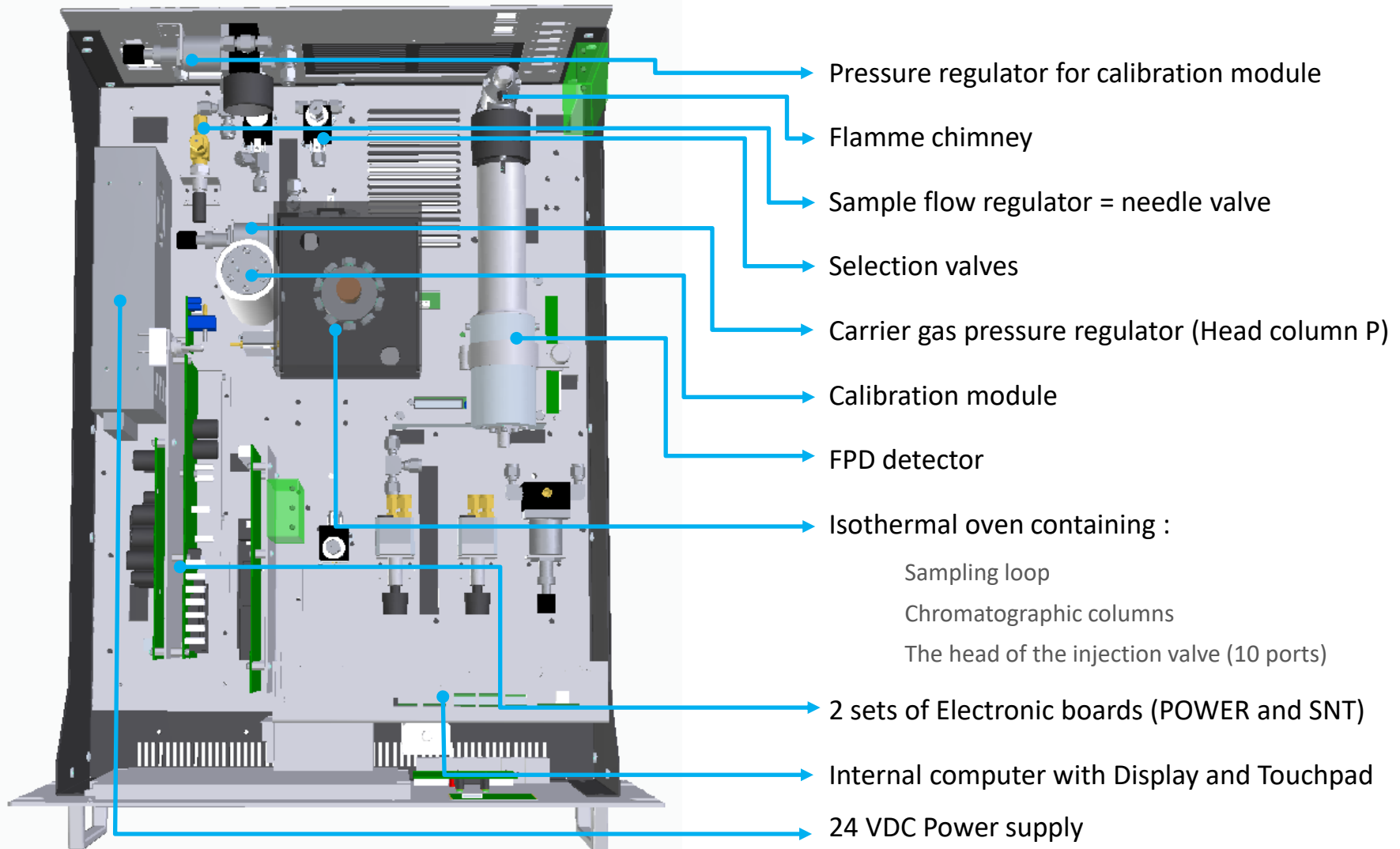


To propose an Odor index

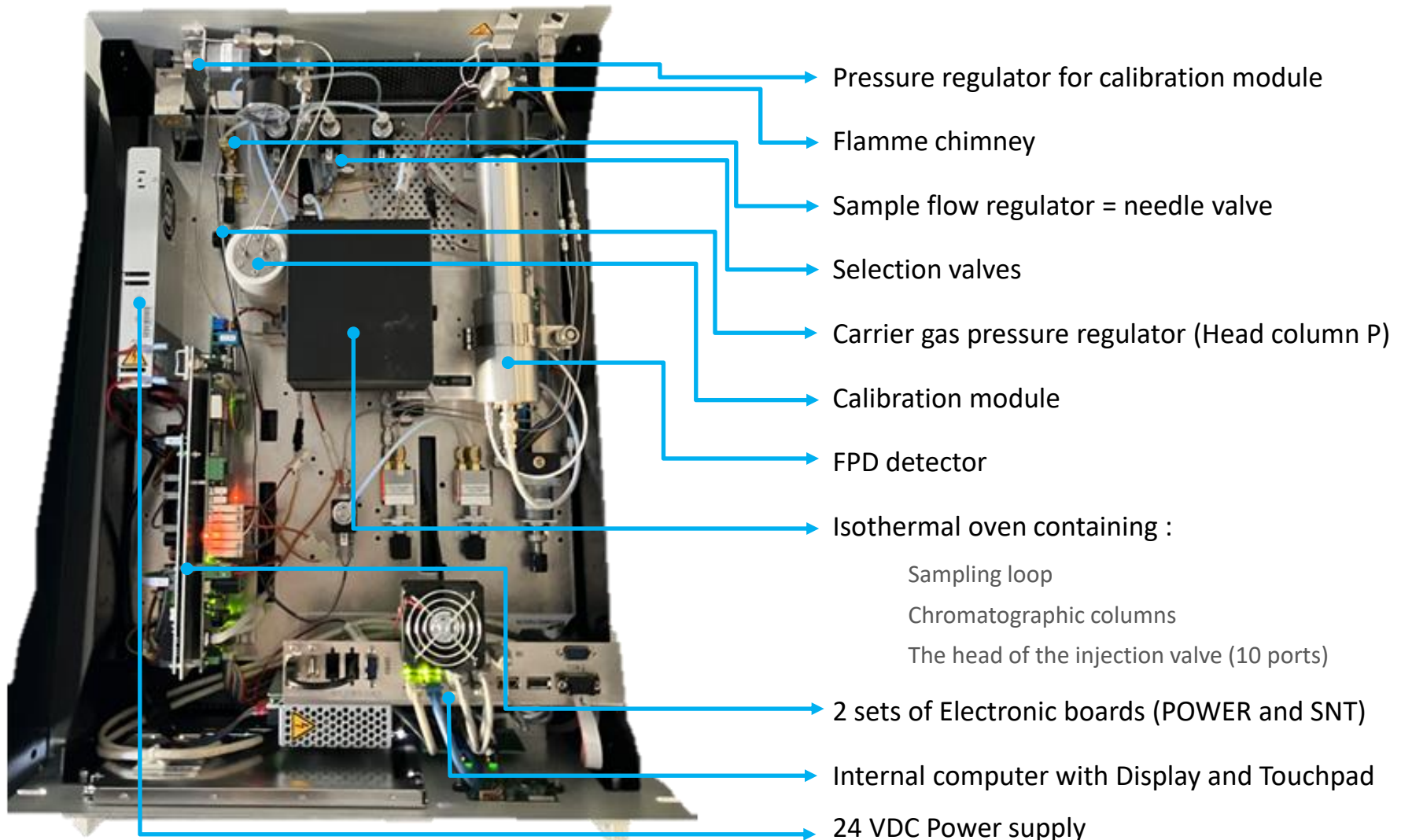
For the « ChromaS » module with COS option

- The sample is injected from a sampling loop into the columns.
- The sample travels through the columns, to separate the sulfur compounds, and is introduced to the FPD detector for the detection of sulfur species.
- The detection is achieved by a Flame Photometric Detection, specific to the sulfur compounds.
- Specific methods are used in order to better separate H_2S and COS that usually coeluate.

Top View : ChromaS

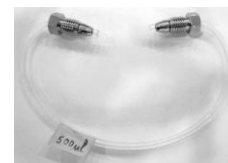


Top View : ChromaS

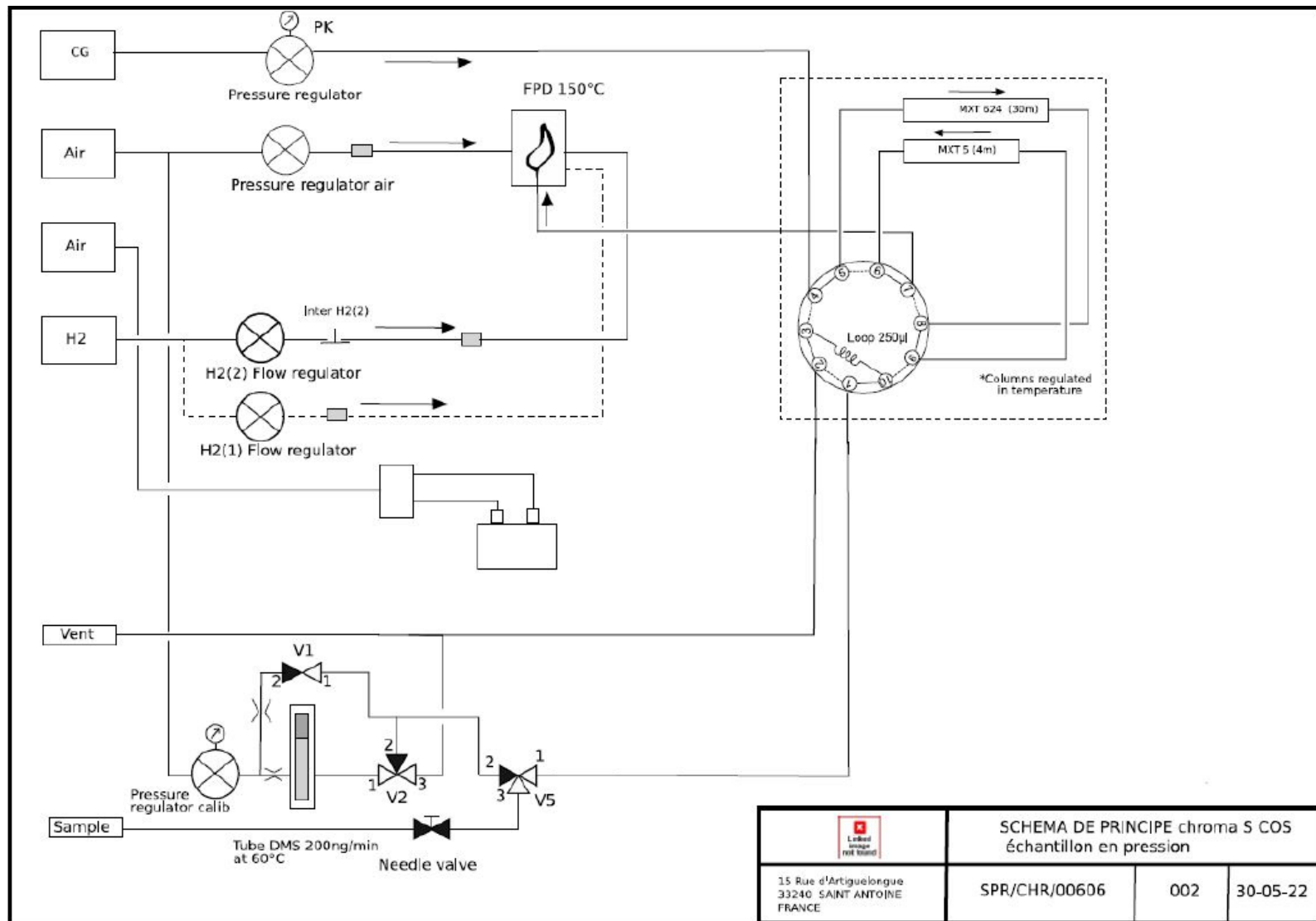


Principle – ChS : Sampling phase

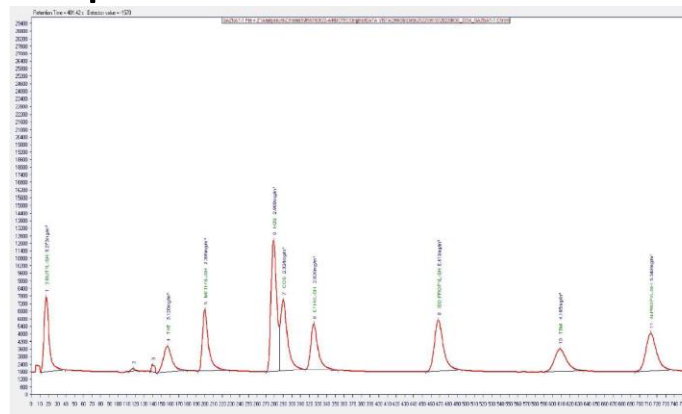
- The sample gas circulation is carried out:
 - Overpressurised sample (~ 1 bar)
 - Flow regulation done by a needle valve
 - The sample flushes a sampling loop
- Carrier gas travels through the columns, burned into the chimney and then detected by the FPD
- Flat signal is emitted by the ChromaS detector: “base line”



Principle – ChromaS Pneumatics

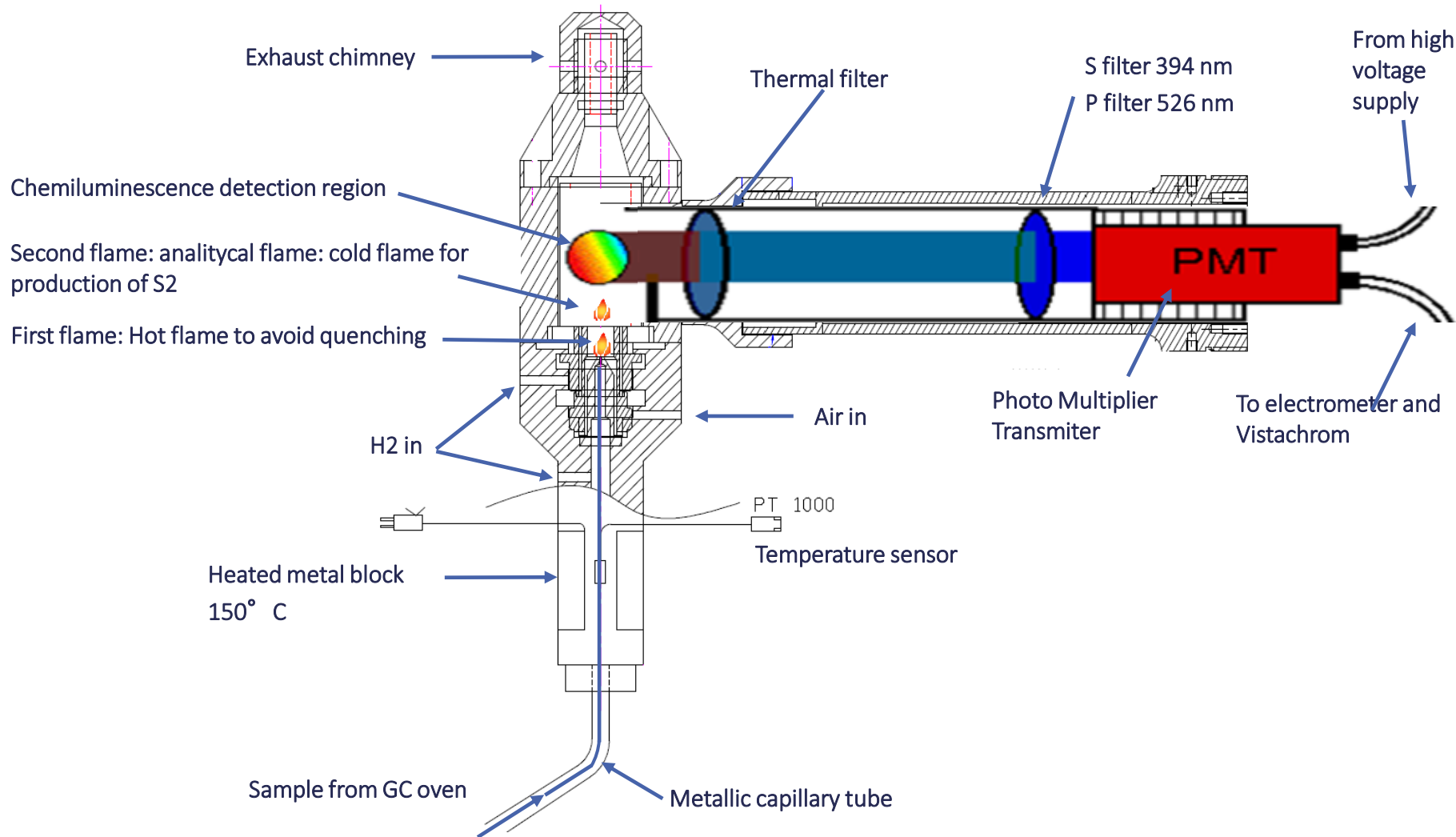


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Principle – FPD Detection

- The sulfurs are detected by the Flame Photometric Detector



- First flame: Optimized to oxidize hydrocarbons toward carbon dioxide formation : Hot flame → to reduce the « quenching »
- Second flame : Optimized to produce analyte chemiluminescence for measurement S_2^* : cold flame
 - Reduced quenching
 - Improved response uniformity
 - Improved reproducibility

Installation

OPERATING CONDITIONS					
GAS	He (5.5)	H ₂ (5.6)	Nitrogen (Nitroxchrom #56881019)		
Inlet pressure	----	----	3 Bars		Ar (6.0) Zero air
Used pressure	----	----	CG	Permeation oven	----
Flow rate (ml/min)	----	----	198 (+/-2) hPa	≈ 0.4 bar	----
			CG	Permeation oven	----
			3.5-4	111.04 or 207.80	----

- Before unboxing the instrument
 - Read the QC report (most important document)
 - Read the easy start document
 - Purge the gas generator during one hour! (no connection the generator to the GC)
 - Purge your sampling line during 1 hour ! (no connection the line to the GC)
 - Intelligently select the location for the instrument : no vibration, smooth Air Conditionning...

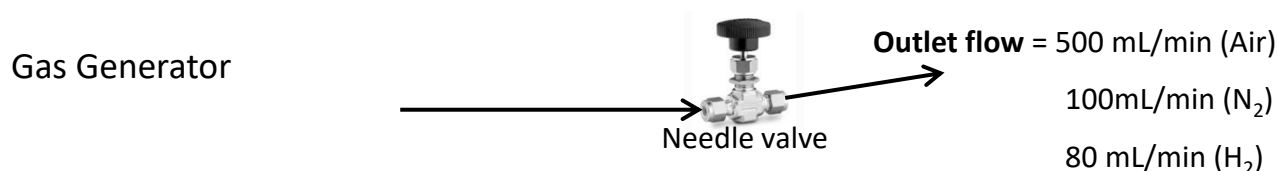


The damages created by skipping the purge of the generators will not be covered by the warranty!

Installation – Purge the gas

- **Purge** all your gas generators during **1 hour**:

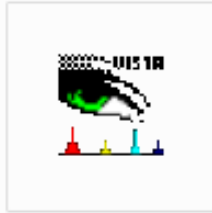
↳ During this purge, the generators **MUST** be disconnected from the GC !



↳ The gas have to be well dried and very pure, before feeding the analyzers.

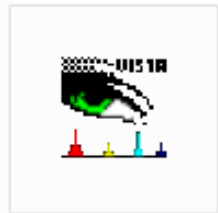
The damages created by skipping the purge of the generators will not be covered by the warranty!

Vistachrom Software



- Full analytical control
- Automatic storage of data (sample gas and calibration results)
- Visualization of the results obtained
- Full traceability for quality and audit trail purposes
- Real-time results transmitted via standard transfer protocols

Software – Log in



Vistachrom Log in

- Login : "SUPERUSER"
- Password : "1234"

Log in

Vistachrom

A red chromatogram line with several peaks, positioned to the right of the Vistachrom title.
The Chromatotec logo, featuring a stylized sun rising over a chromatogram peak, with the text "CHROMATOTEC" below it.

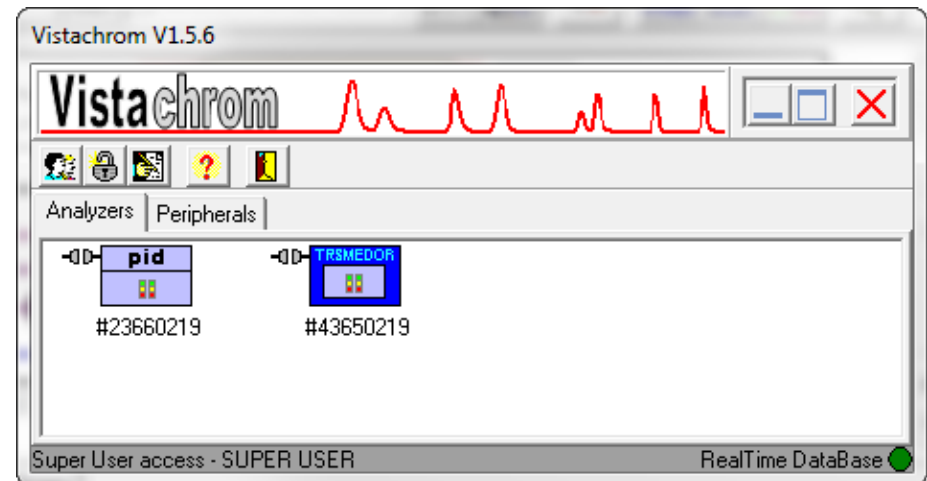
User Name :

Password :

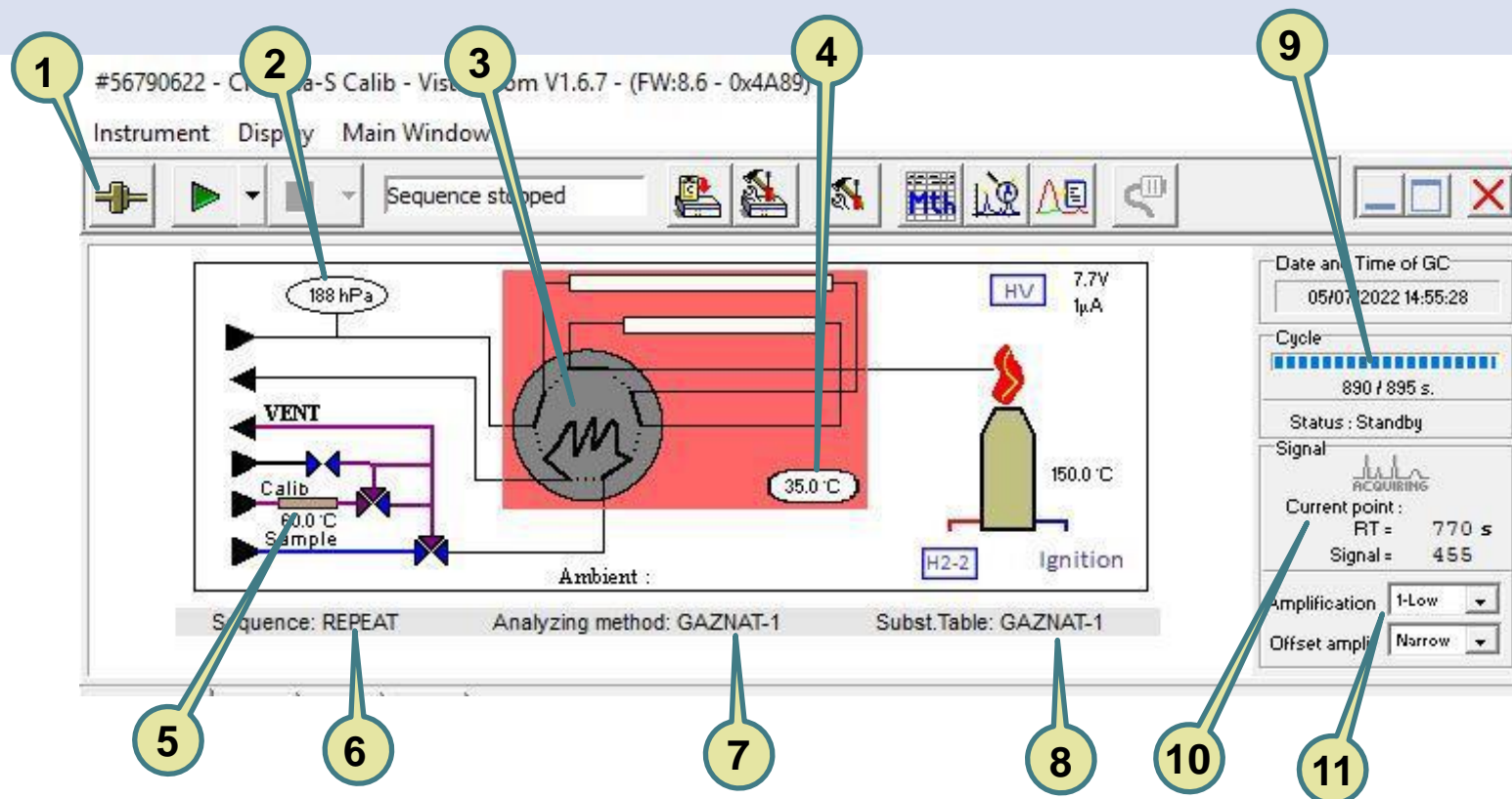
Software – “Main Window”

Main Window

- Each of the two modules is identified by the serial number
- Double-click on the SN to open the two “GC Windows”

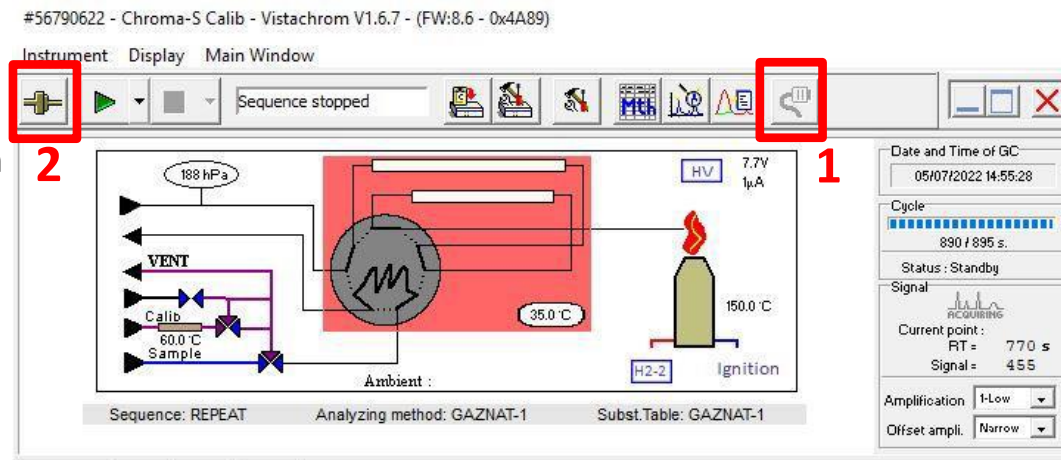


Software – “GC Window”



Software – Log on

- GC and computer must be ON
- LEDs on the two front panels : “stand by” and “OK” are ON, then:



2. Press on this icon to establish the communication GC-PC

1. Check the COM port is the one used for the communication GC-PC.

Verifications to do, before starting the first cycles

On the software:

- Head column pressure
- Calibration temperature
- Column temperature in stand by
- Check the two modules are perfectly synchronized (clock)

Physically on the instrument:

- Connect the instruments to an UPS
- Were the gas generators purged one hour?
- Is the sample overpressurized (1 bar) ?
- Sampling flow measurement
- Calibration flows measurements
- Check the gas pressures : H₂, N₂, Air
- Install the permeation tubes in the oven

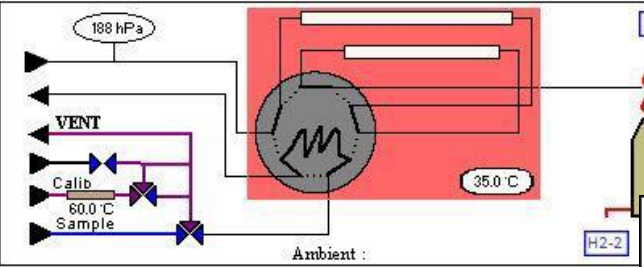
Software – Upload Sequence

#56790622 - Chroma-S Calib - Vistachrom V1.6.7 - (FW:8.6 - 0x4A89)

– Upload the sequence on the ChromaS

Instrument Display Main Window

Sequence stopped



Sequence: REPEAT Analyzing method: GAZNAT-1 Subst. Table

Date and Time of GC: 05/07/2022 14:55:28

Cycle: 890 / 895 s.

Status: Standby

Signal: ACQUISITION

#53560921 - Chroma-S - Vistachrom V1.6.7

Instrument Display Main Window

Instrument not connected

Ouvrir

Regarder dans: Program

Nom	Modifié le	Type
Others	30/05/2022 11:21	Dossier de fi
AMB-AAA.Cpt	06/12/2021 15:20	Chromatote
CALIB-A2.Cpt	12/10/2021 15:21	Chromatote
CHECK.Cpt	30/05/2022 11:58	Chromatote
CYL25NH3.Cpt	06/12/2021 15:16	Chromatote
IGNITE.Cpt	30/05/2022 11:59	Chromatote
LIN-A2.Cpt	03/12/2021 10:49	Chromatote
REP1-AAA.Cpt	02/11/2021 11:04	Chromatote
REP2-A2.Cpt	12/10/2021 18:13	Chromatote
REP2-AAA.Cpt	02/11/2021 11:05	Chromatote
REP3-AAA.Cpt	02/11/2021 11:06	Chromatote
REP-A2.Cpt	27/10/2021 11:54	Chromatote
REP-AAA.Cpt	02/11/2021 11:03	Chromatote

Nom du fichier: AMB-AAA.Cpt

Types de fichiers: Concept File (*.cpt)

Ouvrir Annuler

Graph range: 56000

56000
44800
33600
22400
11200
0

0 120 24

Distributor access - DISTRIB

Data storage: 

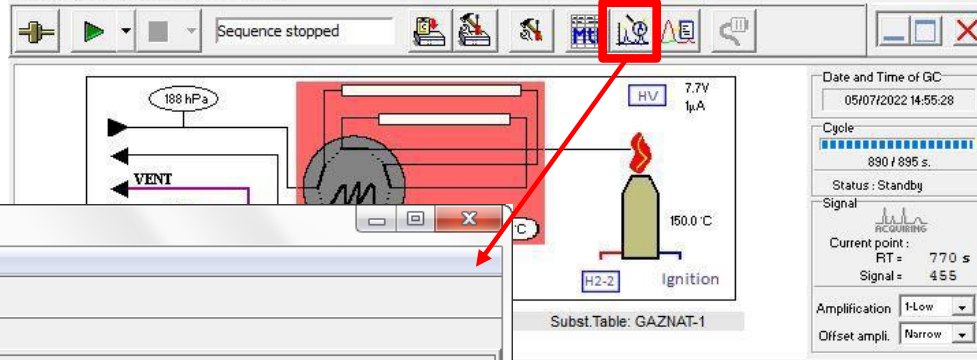
- Data is stored as raw chromatograms and ASCII files (Excel)
- Data files are recorded and stored with date, time, and method stamp
- Data can be transmitted to data acquisition system via Modbus protocol, 4-20mA module, ...

Software – View chromatograms

PeakViewer software:

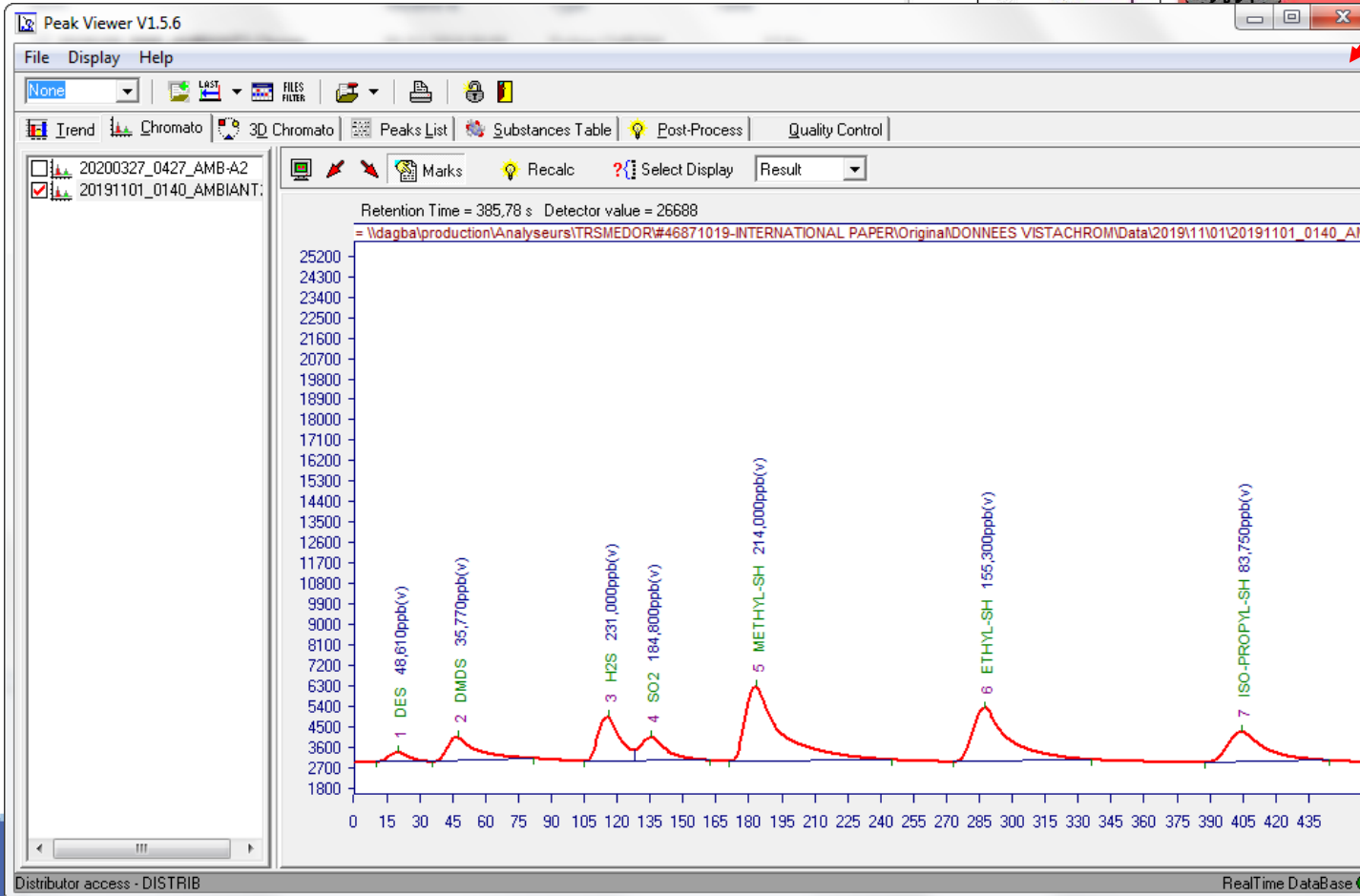
#56790622 - Chroma-S Calib - Vistachrom V1.6.7 - (FW:8.6 - 0x4A89)

Instrument Display Main Window



To check :

- Concentrations
- Retention times
- Trend on several days
- Post-process options
- Post-Integration options
- Statistics calculations
- ...



ChromaS Response formulas

- The Flame Photometric Detector (FPD) does not have a linear response
- The response expected for each sulphur compound can be described by this formula:

$$Concentration_{mg/m3} = a. \left(\frac{Area}{BS} \right)^b$$

Goal of using « BS » parameter:

- Only one calibration gas is required to calibrate each module
- Relative response factors are used to compare a compound to the reference compound

Every week:

- Check the chromatograms (nice base line, stable BS, peaks identification, ...)

Every month:

- Check the operating parameters : Pressures, flows, temperatures
- Check more carefully the results : stability over time, internal calibrations

Every year:

- Do the preventive maintenance actions, replacing the PM parts
- Full check of the instrument : Preset, flows, pressures, sensitivity, RF adjustments...

Service – tools required

Tools you absolutely must have:



Classic tool case:
spanners, screwdrivers, ...



Leak detector



ELECTRONIC FLOWMETER
(RANGE: 1 - 750 ML/MIN)
(TESTED)
CS_OT_00005-3000

Flowmeter



Several Swagelok
fittings
(1/8 and 1/4 size)



Flow regulator



Some meters of
PTFE tubes

Tools advised for advanced users (distributors):



**TRAP TOOL FOR PRESET FOR
CALIBRATION (TESTED)**
CS_OT_00012-0001



**ELECTRONIC MANOMETER
ASSY (RANGE: -1 À 2 BARS
(RELATIVE PRESSURE))
(TESTED)**
CS_SE_00007-MANO



**MULTIMETER WITH
THERMOCOUPLE K OPTION
(TESTED)**
CS_OT_00016-0000



**CALIBRATION RESISTORS SET
FOR TEMPERATURE PRESET
(TESTED)**
CS_EL_00010-0001

Troubleshooting - ChromaS



Symptom	Probable cause	Corrective action
Noisy/irregular base line	Problem on the FPD (dust, ...)	Remove the detector tube from the chimney. Clean the mirror inside with ethanol and wool. Dry it and put it back.
	Electronic noise	Check the voltage at the ignitor's Matt&Lock (~1,9V).
Peaks not identified	Head column pressure (HCP) is out of range	Check air pressure applied to the GC : 3 bars Adjust the HCP checking the QC report Adjust the RT ranges in the substance tables
	Oven temperature is not correct	Check that the environment temperature is stable Check the PT1000 temperature sensor is well connected
Base Sensitivity is not correct	The calibration flow is not correct	Check and adjust the calibration flow
	The permeation oven T is not correct	Check the Calib T according to the QC report
	The expected concentration of DMS is not correct	Check and adjust this concentration (in mg/m ³) in the calib substance table
	BS is out of range	Check in the calib substance table, the experimental BS is in the expected BS range
	Permeation tube is empty	Replace the permeation tube : every year

Troubleshooting - ChromaS

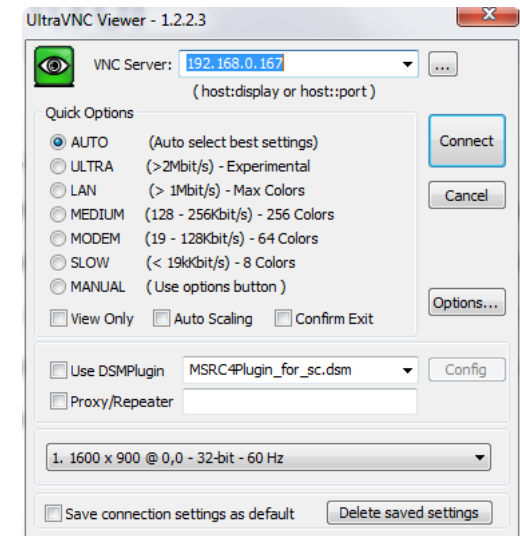


Symptom	Probable cause	Corrective action
No detection, Flat base line	Offset setting is not correct	Adjust the offset to have the signal between 0 and 65000 If « auto-offset option » is used, check the configuration is OK
	Sample flow is not correct	Adjust the sampling flow with the internal needle valve, measuring it with a flowmeter at the vent outlet
	The injection valve does not actuate	Check gas pressure applied on the valve : 3 bar Check injection valve functioning Replace the PM parts of the valve : rotor, actuator...
	The mirror inside the detector is dirty	Clean the mirror inside the FPD tube, dry it and reinstall it
Impossible to log on	GC is OFF (LEDs OFF on the front panel)	Use the internal Power switch to switch On the GC
	COM port used by Vistachrom is not the right one	Change the COM port used by Vistachrom
	Electronic bug	Start a « Hard reset »
Other strange phenomenons	Electronic/software bug	Start a « Hard reset »

Remote control

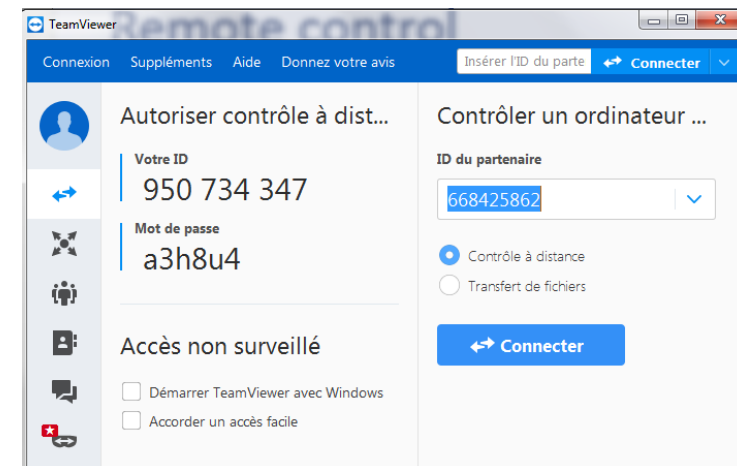
UltraVNC:

- Easy to use for local area connections
- On the Chromatotec computer, the software is automatically started at Windows start up
- On the remote computer, just write the IP address of the Chromatotec computer



TeamViewer:

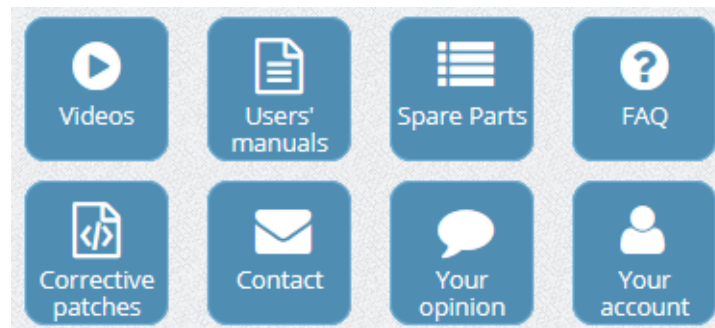
- Easy to use for connections through internet
- On the Chromatotec computer, start the software from: D/TeamViewer
- On the Chromatotec computer, write down the IP and password written in TeamViewer
- On the remote computer, just write these ID and password



Visit our technical website

We highly recommend you to have a look to our technical website.

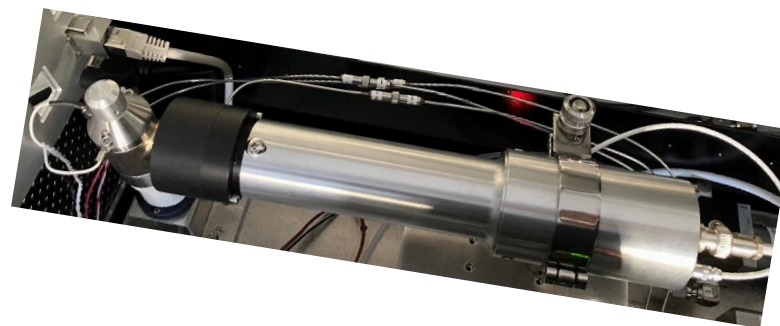
<https://support.chromatotec.com/>



It is really helpful to:

- ✓ Start
- ✓ Understand the GC functioning
- ✓ Calibrate
- ✓ Maintain
- ✓ Solve a problem

Thanks!



Thanks for choosing the Chromatotec instruments!

